EXHIBIT A

August 1, 1978

Sumitomo Conversion - Columbia Falls

The following is a brief outline and discussion of the Sumitomo conversion program at Columbia Falls. The problems are divided into three general areas and our approach toward the solution of these problems is discussed. The three general areas are process problems, people problems, and equipment problems.

PROCESS PROBLEMS:

Cathode Failures:

A series of pre-mature cathode failures was the first indication of trouble. When these started, it was assumed that something was wrong with the cathode construction. The Sumitomo experts were consulted, and they came to the same conclusion. Every aspect of the cathode construction program was reviewed and checked. Some minor changes were made but nothing of significance. While all this was going on, time was passing and pots were continuing to be rebuilt at the rate of five per week. As the number of pre-mature failures increased, a pattern emerged. Most of the failures were those pots built with a French (Savoie) carbon block. This provided a clue and ultimately it was discovered that the bond between the steel collector bar and the carbon block was the source of the problem. Use of the French blocks was discontinued. Procedures to control this bond were established and a type of construction

PROCESS PROBLEMS

Cathode Failures: (cont.)

was developed with which there has been little trouble. The problem now seems to be under control. At this point, approximately 35 pots have failed pre-maturely. About half of these were repaired and re-started. The other half had to be completely rebuilt. There are approximately 35 other pots which currently indicate pre-mature failure (high iron level in the metal). Normal pot life is 1200 - 1500 days. These early failures are less than 400 days. Considerable time has been lost because of these failures as each rebuilt or repair job required the equivalent time of rebuilding an old style pot. Cost of each pot is approximately $35,000.

Anode Problems:

Beginning in early spring of this year, severe anode problems began to occur on various pots within the plant. Spiking, separation, poor current distribution, and bake-up conditions were discovered on many pots. However, the anode problems were minimized in Room 9 due to the concentrated effort which had been made there in order to allow an early evaluation of the program. All the pots in Room 9 had been converted to Sumitomo cathodes and much more effort had been put on training personnel and improving control techniques. The Sumitomo conversion in Room 9 had been completed with the exception of the computer control.

PROCESS PROBLEMS

Anode Problems: (cont.)

The anode situation elsewhere in the plant reached crisis proportions in June and July causing us to reassess our conversion program and the schedule called for in the Conceptual Control Plan. Because of the immediate need for additional manpower to handle the anode problems, it was decided to temporarily cancel the pot conversion program. Union people agreed to work out of their classification, extra supervision was brought in from the Sebree, Kentucky, plant, and approximately 70 additional people were hired to help bring the situation under control.

The anode problem centered around two matters. First, the anode casing crossbeam was too low in the paste. With the old more fluid type anode, this was no problem as the paste would flow under the beam. With the dry type paste, this was not the case. Voids or cavities developed under the beams and as these passed downward, serious anode problems developed. A crash program was instituted to raise the anode crossbeams on all operating pots as quickly as possible. Extra crews working around the clock reduced the number of anode spikes to the point where the normal crews could handle the situation.

Spike removal is a very difficult, strenuous,hot task. Normally several of the anode skirts have to be removed in order to facilitate the removal of the carbon chunks. The spikes project downward from the anode surface, and they have to be broken loose with crowbars. The carbon

PROCESS PROBLEMS

Anode Problems: (cont.)

then has to be raked out of the pot. This procedure may take from a few minutes to several hours, depending upon the severity of the problem. This abnormal condition increases emissions, and at the height of the problem we were experiencing 50 to 60 spikes per day. Pot rebuild was started again at the earliest opportunity at the rate of three pots per week until such time that our problems have again become manageable. At that time we intend to go back to five pots per week.

The second matter concerning the anode problem involved the anode service functions; namely, pin pulling and setting procedures and anode paste quality. Tighter quality control standards were established in the carbon plant and quality control technicians were trained and placed. Engineers were assigned around the clock to follow the pin pulling and setting operations. Technicians were hired and trained, and they have now relieved the engineers in this function. Several months will be required to determine if we have solved all of our anode problems as it takes approximately 70-80 days for an anode to cycle completely since it is consumed at a rate of 3/4" to 1" per day.

There is a residual problem from the severe anode difficulties. Much of the success of a new cathode is determined by the current distribution at the time the cathode is baked. Any localized overheating caused by poor current distribution dooms that cathode to an early failure regardless of its construction. To achieve an uniform, even bake

PROCESS PROBLEMS

Anode Problems: (cont.)

requires a good anode. Standards have been established on what constitutes a good (acceptable) anode and substandard anodes will not be used for baking new cathodes. This could result in some delays in cathode conversion until the overall anode condition improves. To do otherwise would be self-defeating.

PEOPLE PROBLEMS

An existing work force, both day pay and supervisory, had to be retrained in a new technology. This was not an easy task as many of these people had successfully operated this plant for over 20 years and they now had to be convinced to perform their jobs differently.

The operation had to absorb an influx of new hires, none of whom had any reduction plant experience. This placed a training burden on the existing supervisory structure which it was not equipped to handle. There was also a tendency by many of the more senior experienced employees to bid off their regular jobs which is permitted by the union contract as the operating difficulties increased and their jobs became more demanding. This advanced the totally untrained and inexperienced new hires into jobs requiring experience and skills at a much faster rate than normal.

There was a near desperate need to strengthen the control functions and the entire operation had to be more closely monitored. This

PEOPLE PROBLEMS (cont.)

required the selection and training of a new group of technicians. The technician requirements called for the better educated, more experienced employee from the day pay ranks. Because of the screening required, we could not move as fast as we wanted in getting these people on the job. In addition, technically qualified new staff members are being hired from the outside for the control functions.

As a result of all of the above-mentioned people problems, the tendency has been to overman the job. The accident rate and equipment damage have indicated that the end point has been reached with this approach.

Unfortunately, there is no quick cure to all of the above. It will take time. The following steps have been taken with regard to employee training:

1. An entry level training program is being designed and will be underway by late fall. New hires will be given a basic training in plant operations, safety, and vehicle operation.
2. Within the Reduction Department, a job training program is underway. Here the employee will be trained in the Sumitomo technology and for the specific jobs he is to perform.

Getting underway has not been easy. Removing a person from their job to train them leaves an even more inexperienced person in their place. This has acted as a constraint on the rate the program can move. Removing an experienced supervisor to act as a teacher leaves a less experienced supervisor in his place which is another constraint. The program is underway, however, and it will be pushed as hard as possible.

EQUIPMENT PROBLEMS

Fundamental differences between the Sumitomo pot (highly insulated) and the old Anaconda pot require re-examination of most of the process equipment. Because of the sensitive nature of the Sumitomo pot with regard to the heat and energy balance, the process control has to be precise, and the necessary equipment has to be available in order to achieve this control. A consultant has been hired to assist us in determining a plan to obtain the additional equipment we have now determined is necessary to allow us to operate the pots and obtain optimum results from the Sumitomo technology.

It is now felt that our procedures for oreing, tapping, chemical additions, and pin pulling will have to be modified. Initially Sumitomo felt we could utilize their technology with our existing equipment, but they now agree that additional and better equipment is required for some functions. Specifically, new trucks will be required for oreing and chemical additions. Additional pin pulling cranes are required since the pins will have to be pulled more frequently than originally thought. Tapping equipment will have to be modified to allow more precise control of the amount of metal tapped. Control equipment such as a new x-ray machine for bath analysis is being investigated.

At this time the process control computer is just coming on stream. When this equipment is fully debugged and operational, control of certain process parameters should become routine and this should minimize operating problems.

EQUIPMENT PROBLEMS (cont.)

Unrelated to Sumitomo but as a part of the emission control program, major modifications are being made in the duct work of the dry scrubber installation in order to improve the system's reliability.

SUMMARY

As a result of all of the above-mentioned problems, we have incurred increased material costs, labor costs (approximately 70 extra people), lost metal production (2,000,000 lbs/month), metal grade problems (high iron levels), increased emission levels, and lost time in the conversion schedule.

On the encouraging side, however, we have identified most of the problems and are diligently seeking answers to each.

In this regard, we continue to be encouraged in the ultimate effects which Sumitomo has represented can be achieved. We are solving each problem in a methodical and thorough manner in recognition that the application and operation of the system is very complex.

We have been able to meet the Montana emissions standards, as well as the EPA new source performance standards, for fluorides in Room 9, and we continue to believe that given time we can meet the Montana emission standards on a continuing basis. We have demonstrated that we can do it, and we fully intend to do so as quickly as we can.

ATTACHMENTS:

Glossary
Schematic (construction of VSS pot)

GLOSSARY OF TERMS

Alumina - The raw material from which aluminum is made (also called ore). (Chemical Symbol -- Al_2O_3)

Aluminum Fluoride -- A major chemical component of bath. (Chemical Symbol -- AlF_3)

Alumina Concentration -- The amount of alumina in solution in bath expressed as a weight percentage.

Anode -- The positive carbon electrode forming the top part of the cell.

Anode Effect (Light) -- A condition in the cell caused by alumina depletion and characterized by high resistance at anode face and high pot voltage.

Anode Paste -- The carbon material used in forming the anode. It consists of a mixture of liquid pitch binder and petroleum coke aggregate and is added in the form of briquettes.

Anode Spike -- Carbon projection on the anode surface.

Bake-up -- Uneven baking throughout the anode caused by localized overheating.

Bath -- A chemical combination of sodium fluoride (chemical symbol NaF) and aluminum fluoride (chemical symbol AlF_3) containing various amounts of alumina (Al_2O_3) and calcium fluoride (CaF_2) in solution.

Baking -- The process of preheating and conditioning the cathode prior to cut-in on bath.

Calcium Fluoride -- (Spar) Chemical symbol CaF_2) -- a chemical component of bath.

Cathode -- The negative carbon electrode forming the bottom part of the cell consisting of carbon liner and shell.

Cathode Paste -- The carbon material used in filling the slots between the carbon blocks and forming the sidewall. It consists of approximately 14% low melting point pitch binder and 86% anthracite coal aggregate.

Cell Volts -- The electrical force that pushes current across the cell from anode bus to cathode bus excluding main bus system.

Collector Bars -- The steel conductors that carry current from the cathode bus to the cathode liner. There are 13 bars to a cell.

Cryolite -- Electrolytic bath used for aluminum reduction (Chemical symbol -- Na_3AlF_6).

Current (direct) -- The electrical energy that provides the heat and electrolytic action to carry on the reduction process.

Current Efficiency -- The percentage ratio between actual metal production and theoretical metal production.

Heat Balance -- A condition in the cell where by the heat energy put into the cell is equal to the heat retained in the cell plus the heat dissipated from the cell. If heat input is greater than dissipation, the cell heats up and visa versa.

Ledge -- A buildup of the higher melting point bath components around the periphery of the cathode.

Metal Pad -- The pool of metal underlying the bath.

Petroleum Coke (Pet Coke) -- The carbon material that makes up the aggregate part of anode paste. It is equivalent to the sand and gravel in concrete.

Pitch -- The binding material used in hold anode and cathode paste together. It is equivalent to the cement binder in concrete. Anode pitch has 100-110° melting point and cathode pitch about 60°C.

Pins -- The steel conductors that carry the current into the anode. There are 50 pins to a pot.

Ratio -- The relationship between the aluminum fluoride and sodium fluoride content in the bath.

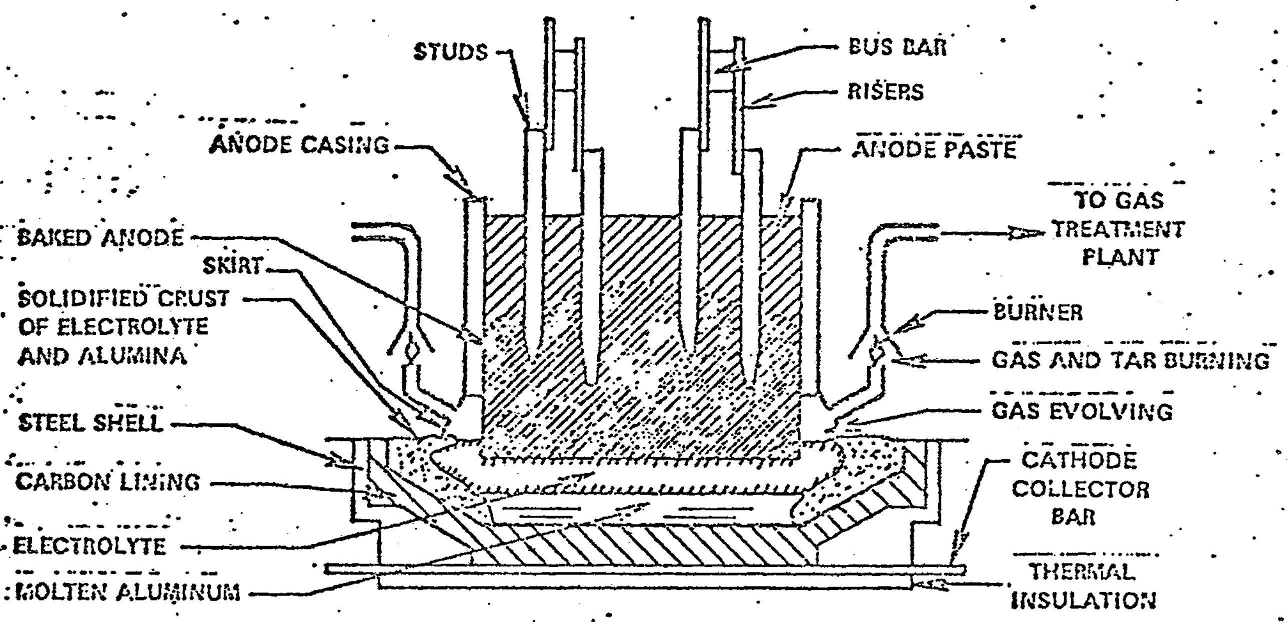
Rammed Slots -- Spaces between individual cathode blocks in the cathode lining filled and air compacted with cathode paste.

Rammed Side Walls -- The sloped portion around the periphery of the cathode liner consisting of air compacted cathode paste.

Reset Height -- The vertical distance that the anode pin is lifted during pin pulling.

Side Wall Blocks -- Carbon base blocks used in side wall construction.

Sodium Fluoride -- A major chemical component of bath. Chemical symbol NaF).



Details of vertical stud Soderberg reduction cell.